

Introduction to OpenCV

Part1. C++

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OpenCV

- ▶ Intel open source computer vision library
- ▶ It is a collection of C functions and a few C++ classes that implement some popular Image Processing and Computer Vision algorithms
- ▶ High speed implementations of functions commonly used in Computer Vision/Image Processing
- ▶ Available for Python, Ruby, Matlab, Lua
- ▶ Download
<http://sourceforge.net/projects/opencvlibrary/>
- ▶ Some tutorials: <http://www.site.uottawa.ca/~laganier/tutorial/opencv+directshow/cvision.htm>
<http://www.softintegration.com/products/thirdparty/opencv/demos/>

OpenCV functions:

OpenCV Overview: > 500 functions

opencv.willowgarage.com

Robot support



General Image Processing Functions



Segmentation



Transforms



Machine Learning: • Detection, • Recognition



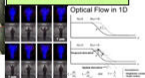
Geometric descriptors



Features



Tracking



Matrix Math



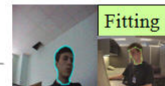
Image Pyramids



Camera calibration, Stereo, 3D



Utilities and Data Structures



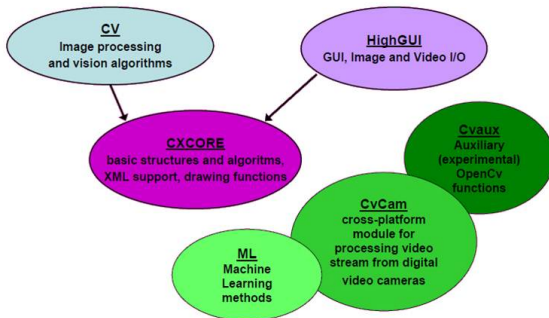
Fitting



Image Types

OpenCV Tag	Representation	OpenCV Value
CV_8U	8 bit unsigned integer	0
CV_8S	8 bit signed integer	1
CV_16U	16 bit unsigned integer	2
CV_16S	16 bit signed integer	3
CV_32S	32 bit signed integer	4
CV_32F	32 bit floating point number	5
CV_64F	64 bit floating point number	6

OpenCV modules



- ▶ cv - Main OpenCV functions.
- ▶ cvaux - Auxiliary (experimental) OpenCV functions.
- ▶ cxcore - Data structures and linear algebra support.
- ▶ highgui - GUI functions.

Simple opencv code

```
# include < highgui.h >
int main(int argc, char** argv)
{
    IplImage *image = cvLoadImage(testimage.jpg, 1);
    // window for the image
    cvNamedWindow(Test,CV_WINDOW_AUTOSIZE);
    // show the image
    cvShowImage(Test, image);
    // wait for the button
    cvWaitKey(0);
    // clean memory cvReleaseImage(& image);
    // destroy window
    cvDestroyWindow(Test);
    return 0;
}
```

Sources

- ▶ <http://www.stat.washington.edu/hoytak/blog/whypython.html>

Links

- ▶ Reference manuals:
<c:/opencv/docs/index.htm>
- ▶ Web resources:
Official webpage:
<http://www.intel.com/technology/computing/opencv/>
Software download:
<http://sourceforge.net/projects/opencvlibrary/>
- ▶ Books:
Open Source Computer Vision Library by Gary R. Bradski, Vadim Pisarevsky, and Jean-Yves Bouguet, Springer, 1st ed. (June, 2006).